Streptococcal Pharyngitis in Adults: Can It Be Efficiently and Effectively Managed by Remote Control?

In this issue, Fine and colleagues (1) propose a solution to managing the ever-present threat of group A streptococcal (GAS) pharyngitis. Adult streptococcal pharyngitis continues to worry and perplex clinicians and public health authorities. Which patients require evaluation, and which require treatment? Answering these questions would not only improve care but probably save valuable resources.

Fine and colleagues retrospectively analyzed data from more than 70 000 patients presenting with pharyngitis to derive a "home score" algorithm to identify whether further evaluation was needed. The algorithm incorporates recent local biosurveillance data and responses to questions answered without any clinical training. The authors conclude that using this algorithm might save hundreds of thousands of visits for pharyngitis annually in the United States. Although Fine and colleagues should be commended for this intensive attempt to simplify the approach to this endemic infection in "adults" and render it less expensive, certain aspects of their home score are sufficiently controversial to encourage additional consideration.

First, the broad age range from 15 years to much older "adults" is worrisome. Adults with pharyngitis present different problems than children, so analyses stratified by age categories are needed. Group A streptococcal pharyngitis is relatively uncommon in persons older than 50 or 60 years. The acquisition of type-specific anti–M-protein antibodies after decades of exposure to various types of group A streptococci might protect against recurrent infections with the homologous M types of group A streptococci (2, 3).

A more exacting age-related analysis would give needed validity to the home score in truly older adults. Certainly one would expect that persons aged 15 to approximately 18 years would be at higher risk for GAS pharyngitis. Persons in their 20s seem also to have an increased susceptibility to streptococcal infection, as continues to be reported among military recruits. Another age-related consideration is the probability that adults in their 30s and 40s are more likely to have school-aged children at home and therefore are more likely to become colonized or infected (4, 5).

The recent revised guidelines for the diagnosis and management of GAS pharyngitis by the Infectious Diseases Society of America (6) express the need for attention to age when considering streptococcal pharyngitis. The guidelines even include a special section devoted to adults suspected of having streptococcal pharyngitis, noting that using algorithms potentially "would result in treatment of an unacceptably large number of adults with non-streptococcal pharyngitis."

Second, the accuracy of local disease incidence from biosurveillance data used in the model is also concerning. It assumes an even prevalence across an entire community. The prevalence of GAS pharyngitis is most often studied in children (as a reflection of community prevalence) but may vary among groups in any population, as Werner and associates (7) documented in the 1950s in Philadelphia. Studies in adults with clusters of suppurative sequelae show the same phenomenon. Equally important, one wonders how realistic or practical real-time surveillance is or can eventually be in most communities, be they dense urban populations or sparsely settled rural communities. Uncomplicated streptococcal pharyngitis has not been reportable to health departments for several decades in most states in the United States.

Third, Fine and colleagues do not describe the potential effects (either positive or negative) of the decisions made by the multiple clinicians from more than 70 clinics that the patients attended. This is frequently a recurring problem, especially in a retrospective study and particularly one that includes so many clinics.

Finally, among the most important issues requiring additional thought is the need to differentiate true GAS infection from upper respiratory tract "carriers" among "adults." In Fine and colleagues' analyses, identification or recovery of the organism in the upper respiratory tract is equated with streptococcal *infection*. This assumption should be questioned. The clinical and epidemiologic implications of the 2 states differ.

Many have written about the epidemiologic and pathogenetic differences between the clinical implications of true GAS infection and the GAS carrier (8). Although older adults are less likely to develop nonsuppurative sequelae even after true GAS infection, the epidemiologic risk for spread of the organism to others is greater among those who have true infection, be they adults or children. Fine and colleagues seem to have overlooked this important fact in their data interpretation.

Use of an algorithmic approach to diagnose this common infection has been tried many times, but as concluded several decades ago by the astute clinician–scientist Lewis Wannamaker, "In my view, epidemiologic, clinical, and culture findings are all important. By neglecting any one of them—by necessity or by deliberate choice—we must recognize that we are operating in semi-darkness. At best, the differential diagnosis of streptococcal infection of the upper respiratory tract is an inexact science, one requiring the use and careful evaluation of all available clues and pieces of evidence" (9). This remains clinically true today.

These shortcomings could substantially influence Fine and colleagues' novel approach to this thorny clinical and public health problem, but we should recognize that a more cost-effective approach to GAS infection and carrier

status in both children and adults is still needed. Until we have a proven cost-effective vaccine to protect against *Streptococcus pyogenes*, we cannot expect the magnitude of this medical and public health issue to decrease. Even if a cost-effective vaccine is developed, how it may affect true infections and the carrier state in children may be entirely different in adults. Fine and colleagues have proposed an interim approach, but there are surely others.

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References

1. **Fine AM, Nizet V, Mandl KD.** Participatory medicine: a home score for streptococcal pharyngitis enabled by real-time biosurveillance. A cohort study. Ann Intern Med. 2013;159:577-83.
2. **Lancefield RC.** Persistence of type-specific antibodies in man following infection with group A streptococci. J Exp Med. 1959;110:271-92. [PMID: 13673139]
3. **Bencivenga JF, Johnson DR, Kaplan EL.** Determination of group a streptococcal anti-M type-specific antibody in sera of rheumatic fever patients after 45 years. Clin Infect Dis. 2009;49:1237-9. [PMID: 19761409]
4. **Dingle JH, Badger GF, Jordan Jr WS.** Illness in the Home: A Study of 25,000 Illnesses in a Group of Cleveland Families. Cleveland: Western Reserve Univ Pr; 1964:97-117.
5. **Roy S, Kaplan EL, Rodriguez B, Schreiber JR, Salata RA, Palavecino E, et al.** A family cluster of five cases of group A streptococcal pneumonia. Pediatrics. 2003;112:e61-5. [PMID: 12837907]
6. **Shulman ST, Bisno AL, Clegg HW, Gerber MA, Kaplan EL, Lee G, et al.** Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis. 2012;55:1279-82. [PMID: 23091044]
7. **Werner G, Cornfeld D, Hubbard JP, Rake G.** A study of streptococcal infection in a school population: laboratory methodology. Ann Intern Med. 1958;49:1320-31. [PMID: 13606674]
8. **Kaplan EL.** The group A streptococcal upper respiratory tract carrier state: an enigma. J Pediatr. 1980;97:337-45. [PMID: 6997450]
9. **Wannamaker LW.** Diagnosis of pharyngitis: clinical and epidemiological features. In: Shulman ST, ed. Pharyngitis: Management in an Era of Declining Rheumatic Fever. New York: Praeger Publishers; 1984:33-46.